

## Curriculum Plan KS3 – 2021/2022

Topic	YEAR 8 – CYCLE 1 – Computer Crime & Cyber Security	
<b>Learning Objectives</b>	<p><b>At the end of this Unit all pupils should be able to:</b></p> <ul style="list-style-type: none"> <li>• Name the major Acts concerning computer use</li> <li>• Describe briefly some of the dangers of putting personal data on social networking sites</li> <li>• Describe briefly ways of protecting online identity</li> <li>• Identify some of the signs of fraudulent emails and respond appropriately</li> <li>• Adhere to Copyright Law when using written text, downloading music etc.</li> <li>• List some of the Health and Safety hazards associated with computer use</li> <li>• Describe how to safely dispose of an old computer</li> </ul>	<p><b>Most pupils will be able to:</b></p> <ul style="list-style-type: none"> <li>• Briefly describe the content of the major Acts concerning computer use</li> <li>• Find out what data is held about them by companies such as Google</li> <li>• Recognise fraudulent emails and protect themselves effectively from unwittingly giving personal information (e.g. account numbers and passwords) or otherwise being defrauded</li> <li>• Protect their online identity using Privacy settings and by not uploading personal details</li> <li>• Use computers sensibly and safely with regard to physical hazards such as backache, eyestrain, RSI etc.</li> </ul> <p><b>Some pupils will be able to:</b></p> <ul style="list-style-type: none"> <li>• Respond effectively and appropriately to emails</li> <li>• Describe the effects on individuals and companies of illegally downloading copyright material, e.g. music, images and movies</li> </ul>
<b>Skills to be Gained</b>	<p>This unit covers some of the legal safeguards regarding computer use, including overviews of the Computer Misuse Act, Data Protection Act and Copyright Law and their implications for computer use. Phishing scams and other email frauds, hacking, “data harvesting” identity theft and safe use of social media are discussed together with ways of protecting online identity and privacy. Health and Safety Law and environmental issues such as the safe disposal of old computers are also discussed.</p>	
<b>Assessment</b>	<p>Pupils will sit a multiple choice test as their final assessment.</p>	
<b>Links with Prior/Subsequent Learning</b>	<p>No previous knowledge is required</p>	
<b>Numeracy/Literacy Skills</b>	<p>Vocabulary associated with this Unit, such as: Phishing, hacking, malware, virus, Trojan, logic bomb, geo-tagging, data harvesting, cybercrime, RSI, copyright, e-waste.</p>	
<b>NC Links</b>	<ul style="list-style-type: none"> <li>• understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns</li> </ul>	

## Curriculum Plan KS3 – 2021/2022

Topic	YEAR 8 – CYCLE 2 – First Steps in Small Basic	
<b>Learning Objectives</b>	<p><b>At the end of this Unit all pupils should be able to:</b></p> <ul style="list-style-type: none"> <li>• Write and run programs in Small Basic using For...EndFor loops, variables, input output and selection statements</li> <li>• Create a simple quiz game</li> <li>• Identify and correct syntax errors in a program</li> </ul> <p><b>Most pupils will be able to:</b></p> <ul style="list-style-type: none"> <li>• Use a While...EndWhile loop in a program</li> <li>• Find and correct logic errors in a program</li> <li>• Use the graphics window to draw different shapes in random colours</li> </ul>	<p><b>Some pupils will be able to:</b></p> <ul style="list-style-type: none"> <li>• Use variables effectively to create repeating patterns</li> <li>• Add scoring to their quiz game</li> <li>• Create an effective screensaver which runs until the user stops it</li> </ul>
<b>Skills to be Gained</b>	<p>This unit is an introduction to programming in a textual language designed to make programming easy and approachable for beginners. It starts by introducing Turtle graphics, leading to the use of variables and <b>For...EndFor</b> loops. Simple programs using the Text window are used to introduce input, output and selection. Pupils will get used to these programming statements while having fun producing coloured graphics and making a simple screensaver. They will learn the importance of writing statements accurately, documenting their programs and finding out for themselves in a very visual way how different program statements work.</p>	
<b>Assessment</b>	<p>Pupils will complete an assessment portfolio at the end of the Unit. They will amend an existing program to create a screensaver, paste in evidence of their finished program and complete a brief self-assessment.</p>	
<b>Links with Prior/Subsequent Learning</b>	<p>No previous knowledge of programming is required</p>	
<b>Numeracy/Literacy Skills</b>	<p>Vocabulary associated with this Unit, such as: Syntax, programming environment, Intellisense, graphics window, variable, loop, selection, random number</p>	
<b>NC Links</b>	<ul style="list-style-type: none"> <li>• Use two or more programming languages, one of which is textual, to solve a variety of computational problems; make appropriate use of data structures; design and develop modular programs that use procedures and functions</li> </ul>	

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Topic	YEAR 8 – CYCLE 3 – HTML & Web Development	
<b>Learning Objectives</b>	<p><b>At the end of this Unit all pupils should be able to:</b></p> <ul style="list-style-type: none"> <li>• Write HTML code to create a simple web page and display it in a browser</li> <li>• Write CSS to define the styles used in a web page</li> <li>• Create a simple navigation system using HTML</li> <li>• Use a design to create a template for a web page using HTML</li> <li>• Create their own multi-page website</li> <li>• Insert text, images and links on their web pages</li> </ul>	<p><b>Most pupils will be able to:</b></p> <ul style="list-style-type: none"> <li>• Use a range of HTML tags to create well laid out web pages</li> <li>• Write CSS code to define the styles of different parts of a web page</li> <li>• Use HTML and CSS to create their web page template</li> <li>• Use the template to design a multi-page website with a consistent look and feel to each page</li> <li>• Use responsive design techniques in creating their website so that the web pages will adapt to any size of screen</li> <li>• Create a simple web form to collect user data</li> </ul> <p><b>Some pupils will be able to:</b></p> <ul style="list-style-type: none"> <li>• Add enhancements or additional features to the original basic design</li> <li>• Construct a good-looking, well-formatted interactive website that is suitable for its intended audience</li> </ul>
<b>Skills to be Gained</b>	<p>They will learn how to create text styles and add content, including text and graphics, in a specified position on a page, as well as navigation links to other pages on their website and to external websites. The basics of good design are covered and, with the help of worksheets, pupils will develop their own templates in a text editor such as Notepad. They will decide on a topic for their websites, document their designs and collect suitable text and images. They will then use their HTML templates to create their websites, including a web form. Pupils can view the data collected by the web form into a simulated database. This also helps to stimulate discussion on the privacy of data.</p>	
<b>Assessment</b>	<p>Pupils will put evidence of their final website in an Assessment Portfolio. They will also answer questions on HTML, CSS and web design principles in order to demonstrate understanding. It is recommended that regular teacher assessment, including questioning and observation, is used in each lesson in order to reinforce the evidence of understanding in the Assessment Portfolio.</p>	
<b>Links with Prior / Subsequent Learning</b>	<p>Basic IT skills such as finding images and sizing or cropping them to fit a given space, selecting and editing text will be useful. Pupils should be aware of image size and its relevance to speed of loading a web page containing images.</p>	
<b>Numeracy/Literacy Skills</b>	<p><i>Vocabulary associated with HTML, CSS, Web design and development, such as:</i> HTML, tags, attribute, property, CSS, inline, internal, embedded, external, style, element, text editor, web browser, navigation, responsive design, hyperlink, template</p>	

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<b>NC Links</b>	
<ul style="list-style-type: none"><li>• Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users</li><li>• Create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability</li></ul>	

## Curriculum Plan KS3 – 2021/2022

Topic	YEAR 8 – CYCLE 4 DATABASE DEVELOPMENT	
<b>Learning Objectives</b>	<p><b>At the end of this Unit all pupils should be able to:</b></p> <ul style="list-style-type: none"> <li>• Give examples of databases used by organisations which are accessible to the public via the Internet</li> <li>• Create a database table using several fields with different data types</li> <li>• State the purpose of a primary key in a database</li> <li>• Create a basic input form to input data</li> <li>• Query the database using more than one criterion to find answers to user queries</li> <li>• Create a basic report with suitable headings</li> <li>• Create a front-end application menu with buttons linking to a form and a report</li> </ul>	<p><b>Most pupils will be able to:</b></p> <ul style="list-style-type: none"> <li>• Add features to an input form to make it more user-friendly</li> <li>• Fully customise their input forms and reports</li> </ul> <p><b>Some pupils will be able to:</b></p> <ul style="list-style-type: none"> <li>• Create the relationship between two linked tables</li> <li>• Create a complex query which uses two tables in a relational database</li> <li>• Create a report which uses data from linked tables</li> <li>• Edit a report structure and add subtotals and/or a total to the report</li> </ul>
<b>Skills to be Gained</b>	<p>It is a practical unit covering the basic theory, creation and use of a single-table database and a simple relational database involving two tables in a one-to-many relationship. Pupils will start by looking at an existing single-table database, learning how to add records and make queries. In subsequent lessons they will create:</p> <ul style="list-style-type: none"> <li>• a flat-file or two-table relational database of their own, using suitable field types and adding in appropriate validations</li> <li>• an input form with help text, combo boxes and list boxes</li> <li>• queries and a report using data from one or both tables</li> <li>• a front end menu for their application linking to the database input form and report</li> </ul>	
<b>Assessment</b>	Pupils will create an Assessment Portfolio	
<b>Links with Prior / Subsequent Learning</b>	No previous learning is necessary with this unit. Many pupils may have a basic understanding of databases from previous years.	
<b>Numeracy/Literacy Skills</b>	Vocabulary associated with this Unit, such as: Flat-file database, relational database, table, column, record, field, query, parameter, criterion, criteria, primary key, linked tables	
<b>NC Links</b>	<ul style="list-style-type: none"> <li>• understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems</li> </ul>	

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Topic	YEAR 8 – CYCLE 5 Data Representation	
<b>Learning Objectives</b>	<p><b>At the end of this Unit all students should be able to:</b></p> <ul style="list-style-type: none"> <li>• Define the terms bit, byte, kilobyte, megabyte, gigabyte</li> <li>• Understand that data needs to be converted into a binary format to be processed by a computer</li> <li>• Add two 8-bit binary integers</li> </ul> <p><b>Most students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Define the terms nibble, terabyte and petabyte</li> <li>• Convert positive denary whole numbers (0-255) into 8-bit binary numbers and vice versa</li> <li>• Convert positive denary whole numbers (0-255) into 2-digit hexadecimal numbers and vice versa</li> </ul>	<ul style="list-style-type: none"> <li>• Add two 8-bit binary integers and explain overflow errors which may occur</li> <li>• Understand the use of binary shifts</li> <li>• Understand the use of binary codes to represent characters</li> </ul> <p><b>Some students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Convert between binary, denary and hexadecimal equivalents of the same number</li> <li>• Understand that the number of bits per pixel determines the number of available colours for an image</li> </ul>
<b>Skills to be Gained</b>	In this unit you will explore how computers use binary to represent binary. You will perform some conversions from Denary to Binary & Hexadecimal and look at how images & sound are represented in binary.	
<b>Assessment</b>	<b>Assessment</b> will be based on an end of unit test	
<b>Links with Prior/Subsequent Learning</b>	No previous learning is necessary with this unit. Many pupils may have a basic understanding of binary and its use to represent text and images from previous years.	
<b>Numeracy/Literacy Skills</b>	Vocabulary associated with this unit, such as: Bit, nibble, byte, kilo, mega, giga, tera, peta, binary, bit depth, sample rate, colour depth, pixel, bit per character, binary shift, shift left, shift right, most significant bit, least significant bit, character set, ASCII, Unicode, metadata, hertz, compression, lossy, lossless	
<b>NC Links</b>	<ul style="list-style-type: none"> <li>• Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds, and pictures) can be represented and manipulated digitally, in the form of binary digits; be able to convert between binary and decimal, and perform simple binary arithmetic</li> </ul>	

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Topic	YEAR 8 – CYCLE 6 INTRODUCTION TO PYTHON	
<b>Learning Objectives</b>	<p><b>At the end of this Unit all pupils should be able to:</b></p> <ul style="list-style-type: none"> <li>• Run simple Python programs in Interactive and Script mode</li> <li>• Write pseudocode to outline the steps in an algorithm prior to coding</li> <li>• Write programs using different types of data (e.g. strings and integers)</li> <li>• Correctly use different variable types (e.g. integer and floating point), assignment statements, arithmetic operators</li> <li>• Distinguish between syntax and logic errors and be able to find and correct both types of error</li> <li>• Use relational operators to control the order in which program statements are executed and in what order (if and while statements)</li> </ul>	<p><b>Most pupils will be able to:</b></p> <ul style="list-style-type: none"> <li>• Write an error-free, well-documented program involving selection and iteration</li> <li>• Describe how a binary search is carried out</li> <li>• Explain the advantages of a binary search over a linear search for an ordered list</li> </ul> <p><b>Some pupils will be able to:</b></p> <ul style="list-style-type: none"> <li>• Devise their own algorithms to solve reasonably complex problems, e.g. a binary search</li> <li>• Test and debug their programs, and correct both syntax and logic errors</li> <li>• Make allowances in their programs for user input errors, ensuring that the program still runs to a successful conclusion</li> </ul>
<b>Skills to be Gained</b>	<p>The unit is an introduction to Python, a powerful but easy-to-use high-level programming language. Although Python is an object-oriented language, at this level the object-oriented features of the language are barely in evidence and do not need to be discussed. The focus is on getting pupils to understand the process of developing programs, the importance of writing correct syntax, being able to formulate algorithms for simple programs and debugging their programs.</p>	
<b>Assessment</b>	<p>Pupils will write and run a program and submit the code and screenshots of the program running in a learning Portfolio.</p>	
<b>Links with Prior / Subsequent Learning</b>	<p>No previous learning is necessary with this unit. Pupils may have had some experience of using variables and with a variety of relational operators such as <b>If</b> and <b>Repeat</b> in graphical block-based languages such as Scratch. Applying this knowledge will help their understanding of a text-based language such as Python.</p>	
<b>Numeracy/Literacy Skills</b>	<p>Vocabulary associated with programming and particularly Python, such as: Integrated development, IDLE, interactive mode, Script mode, variable, string, syntax, assignment statement, augmented assignment operator, data type, integer, float, round, BIDMAS, selection, iteration, syntax error, logic error, debug, binary search</p>	
<b>NC Links</b>	<ul style="list-style-type: none"> <li>• Use two or more programming languages, one of which is textual, to solve a variety of computational problems; make appropriate use of data structures; design and develop modular programs that use procedures and functions</li> <li>• Understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem.</li> </ul>	

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